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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/596,922	06/29/2006	Carlo Bacciottini	72NP154562	2369
53082 7590 04/20/2009 General Electric Company GE Global Patent Operation PO Box 861 2 Corporate Drive, Suite 648 Shelton, CT 06484				
EXAMINER				
PRAGER, JESSE M				
ART UNIT		PAPER NUMBER		
4137				
NOTIFICATION DATE		DELIVERY MODE		
04/20/2009		ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

gpo.mail@ge.com  
allyson.camaroli@ge.com

# Office Action Summary

**Application No.**

10/596,922

**Applicant(s)**

BACCIOTTINI, CARLO

**Examiner**

JESSE PRAGER

**Art Unit**

4137

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 6/29/2006.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-10 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SF/ICE)
- Paper No(s)/Mail Date 6-29-2006
- 4) ☐ Interview Summary (PTO-413)
- Paper No(s)/Mail Date \_\_\_\_\_
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_

**DETAILED ACTION**

***Claim Rejections - 35 USC § 112***

1. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

2. Claim 10 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite in that it fails to point out what is included or excluded by the claim language. This claim is an omnibus type claim.

***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1-5, 8 and 9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mannava (US Patent 5,522,706) in view of Nagaoka (JP 1982-193701).

Mannava discloses a rotor disk for a gas turbine (Fig. 1) comprising a central portion with an axial hole (6). Additionally, there is an intermediate portion (8), an outer portion, a series of axial pass-through holes (18) capable of housing tie rods positioned on the outer disk, and a series of slots (Fig. 1). Also in regards to claim 1, it follows based on the similarities in the structure of Mannava, with the placement of the holes relative to the vanes, that the disk rotor obtains a high dynamic characteristic and a sufficiently useful life. In regards to claims 2 and 3, the holes are situated on a base surface in the outer portion (Fig. 1) at an equal distance from each other along a circumference that is

coaxial with the axis of the disk. In regards to claim 5, Mannava discloses a hole with a corresponding vane, so that the number of holes is equal to the number of vanes (Fig. 1). In regards to claim 8, Mannava discloses a diameter of circumference at the axial holes which is close to the diameter of the disk (Fig.1). In regards to claim 9, Mannava discloses a disk of a disk rotor for a compressor (Col. 4, line 40) capable of being joined by a series of tie rods with vanes to hold blades. Mannava does not disclose a first and second collar structure, and a disk rotor composed of series of disks with series of rods and with series of vanes.

Nagaoka teaches of a series of disks with collars having a bevel and relief design connected by a tie bolt. In regards to claim 1, Nagaoka discloses a first and second collar at the central portion of a rotor disk situated at the first and second ends of the central portion (Fig. 1). In regards to claim 4, Nagaoka discloses collar connections (Fig. 3) with the first collar comprising a bevel and a relief, and the second collar comprising a bevel and a relief. In regards to claim 9, a series of disks are disclosed with a series tie rods and a series of vanes.

The operation of a disk with the bevels and relief connection at the first and second collar yields a predictable result, and was applicable to the base reference, Mannava, at the time of the invention as demonstrated by Nagaoka. Thus, it would have been obvious one of ordinary skill at the time of the invention to have disks with first and second collars with the bevel and relief structure because interlocking disks have a stronger connection that, as Nagaoka describes, increases the contact area to help transmit torque more effectively.

Further modifying Mannava disk, by combining multiple disks to form a compressor would have been obvious to anyone of ordinary skill in the art. Connecting multiple disks together was known in the art. The combination would have a predictable result, and would have been motivated by the desire to provide a cost effective compressor design with multiple disks being housed together.

3. Claims 6 and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Mannava (US Patent 5,522,706) in view of Nagaoka (JP 1982-193701) as applied to claim 1-5, 8 and 9 above, and further in view of Huther (US Patent 4,471,008).

Mannava discloses vanes parallel to the axial holes (Fig. 1), and the angle 83 appears to fall into the specified range (see Fig. 2). The exact value of the angle would depend on the thickness of the rotor blade, dimensions of the diameter and the angle of the vane relative to the axial hole. Mannava structure differs from the claimed invention in that the vanes are parallel to the axis of the central hole.

Huther discloses roots of the blades, or vanes with angles relative to the axis of the hole. Huther describes that the angle of pressure ranges from 30 degrees to 75 degrees, and in Fig 2 shows a vane with 40 degrees relative to the "centerline" (11). One of ordinary skill in the art would have been motivated to manufacture the angled vane to Mannava for the purposes of increasing the life of the blades by aligning the vanes to oppose the forces applied to it. This prevents the root of the blade from sliding in the vanes and reduces stress concentrations due to uneven loading on the root of the blade. There is a reasonable basis that angle 83 falls within the prescribed range since the combined reference contains the same structure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to JESSE PRAGER whose telephone number is (571)270-1412. The examiner can normally be reached on Monday-Friday, 8:00 am - 5:00 pm, EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Jackson can be reached on (571)272-4697. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/J. P./  
Examiner, Art Unit 4137

4/13/2009

/Gary Jackson/  
Supervisory Patent Examiner  
Art Unit 4137